**Micro Case 71 – *Microsporum canis* (ringworm; tinea capitis)**

**1. Signs and symptoms for the disease it produces.**

* Raised lesions on head that have nodules in the center and scaling at the periphery
* Followed by erythematous areas that enlarged and coalesced over several weeks
* Pt received a dog prior to illness

**2. The source of infectious organism.**

*Microsporum canis*

**3. The manner of exposure, route of infection, tissues that they reside and, where appropriate, transmission to others.**

* **Habitats are human, animal, and soil**
* Ringworm infections transmitted by **direct contact** w/ lesions or by contact w/ materials, animals, or soil
* 3 modes of transmission found worldwide
  + **Person to person. Anthropophilic** species are found solely on humans
  + **Animal to human. Zoophilic** species predominantly found on animals
  + **Environmental to humans. Geophilic** species found in soil

**4. The pathology and the manner by which the particular disease develops and/or is induced, including damage caused by the pathogen and damage caused by the immune system’s response to the pathogen.**

* **Serpentine and annular lesions** that occur on skin
* **Nodular** and **vesicular lesions**
* Dermatophytes invade keratinized skin but are restricted to the dead cornified layer of the epidermis – dissemination rare b/c can’t grow at body temp
* Arthroconidia adhere to keratinocytes and germinate
  + Humid or moist skin is favorable for establishment of fungal infection
* **Ability to produce keratinases and proteinases enables them to invade keratinized tissues**
* **Immunologically mediated reaction to the fungal antigens that diffuse to the epidermis** causes the clinical manifestations

**5. Methods of identification and placement into a particular biological subset.**

* **Wood’s light**
* **Direct mount** microscopy
* **Culture** of skin scrapes

Dermatophytic molds are **monomorphic fungi.** They like keratin and have **colorless conidia – may have arthroconidia (infecive form) or macroconidia/microconidia (diagnostic form).** *Microsporum canis* have **spindle-shaped macroconidia** and microconidia. They may cause hairs to fluoresce when exposed to UV light (Wood light). Arthroconidia are sought in hairs and may be outside shaft (ectothrix invasion) or inside (endothrix invasion). On Sabouraud dextrose agar appear white from the top of the plate.

**6. Factors leading to enhanced resistance or susceptibility (e.g., recipients of vaccines, residence in geographic areas, types of work, immunodeficiency, alcoholism, age, violence/abuse, religious beliefs, etc.).**

**7. Other organisms in the differential diagnosis and how to discriminate among potential causative agents.**

* Abscesses
  + *Staph aureus*
  + *Strep pyogenes*
* Allergic rashes
* Parasitic rashes
* Ringorm lesions
  + *Microsporum, Epidermophyton,* or *Tricophyton*
* Viral exanthema lesions (e.g. VZV)

Parasitic infections usually have geographic exposure history. Ringworm infections are common in children (this pt is 8 yo) and distinctively unusual in adults. Viral exanthems are not usually confined to the scalp, but occur more commonly as part of a systemic illness.

**8. Prevention, treatment and vaccine design (live vs. dead).**

No vaccine.

Can be treated w/ prescription or nonprescription drugs. Prescription drugs include griseofulvin, terbinafine, itraconazole, fluconazole, and ketoconazole. Nonprescription drugs are undecylenic acide, tolnaftate, or miconazole.